NPIC/TSG/RED/SDB-054-70
24 November 1970

MEMORANDUM FOR THE RECORD

SUBJECT: Part I Preacceptance Test for the High Precision Stereocomparator.

1. Part I of the Preacceptance Test, consisting of the detailed procedures for the operator interface and the significant parameters of the HPSC specifications, was accomplished from 17 to 19 November 1970 [redacted] The tests were scheduled for five days but were accomplished in three days since very few breakdowns occurred. The NPIC personnel taking part in the test were: [redacted] 25X1 25X1 25X1

2. The document used as a test was [redacted] "Acceptance Test-Ultra High Precision Stereocomparator, prepared 6-15-70, revised 9-15-70." This had been reviewed by NPIC and accepted as a satisfactory procedure. The parameters for the test were the "Performance Specifications for the Ultra High Precision Stereocomparator, revised 9-11-70" and agreed upon by contractor and customer. 25X1

3. All components of the HPSC were turned on, and this Console Desk and Panel were checked out. All of the controls worked properly but the Image Brightness meter. This was due to a beam splitter that was damaged earlier in the day. The new beam splitter will be installed prior to the Operational Suitability Test in December and the meter checked at that time.

4. The next test was of the gauge and flow meter readings in Control Rack Number 4. This was a check of items such as: main high and intermediate pressure air regulator, air bearings and guides, vibration isolator pressure, trackball pressure, cooling air pressure, and vacuum clamping. All were acceptable, and several new numbers were established for working with the black box.

5. The trackball sensitivity was checked at low and high speed settings and met specifications.

a. Low speed setting - 360° trackball rotation causes 31.4 to 31.5 micrometers of stage movement.

SUBJECT: Part I Preacceptance Test for the High Precision Stereocomparator

This was in X and Y on both left and right stage.

b. High speed setting - 360° trackball rotation causes 1004.8 micrometers ± 10 per cent of stage movement. Also checked X and Y on both left and right stage.

6. The maximum and minimum stages' speeds were checked on the X and Y of both stages with the joystick while under computer control.

a. The maximum speed fell short of the specifications. About 2.5 inches per second was achieved instead of 3 inches per second.

b. The minimum speed of ten micrometers per second was achieved.

7. The least count of all four axes was tested, and the repeatability was within the ±0.1582 micrometer of the specifications.

8. The time required for film clamping exceeded the 20 seconds established in the Performance Specifications; 6.6" width was substituted for the 5" film mentioned in the specifications. The average time for film clamping was:

a. Left Stage
70mm, 4 mil film - 115 to 2 seconds
6.6mm, UTB 2 mil - 37 seconds
6.6mm, 4 mil - 31 seconds
9½mm, 4 mil - 20 seconds

b. Right Stage
70mm, 4 mil film - 2 seconds
6.6mm, UTB 2 mil - 44 seconds
6.6mm, 4 mil - 71 seconds
9½mm, 4 mil - 40 seconds

While this item is usable as is, [redacted] was not released from the specification. [redacted] is doing further investigation but is not optimistic about lowering the film clamping time. 25X1 25X1

9. Specifications call for illumination and density wedges to accommodate 0 to 3.0 density film. Various density wedges were placed on the film platen, and the illumination

SUBJECT: Part I Preacceptance Test for the High Precision Stereocomparator

was adjusted to provide the same light as that in the open gate position. A 3.0 density film was partially covered by 0.1 density in the same field of view, and the 0.1 difference could be differentiated.

10. A 546 millimicron medium transmission wavelength filter is located in the lamp house and can be removed by remote controls.

11. The test for image wander during fine focus was postponed. This cannot be accomplished by simple observation of a target because the target goes out of focus. This will be further evaluated to determine if this test is a valid requirement. If it is required, it will be accomplished in December.

12. The anamorph range of each optical train was tested. The 1:1 to 1.2 range was achieved, and the anamorph setting agreed with the anamorph targets (provided by NPIC) to within 1 or 2 per cent.

13. The overall magnification of the main zoom system for both the left and right optical train was tested. This met the specifications for a 10 to 1 zoom range.

14. The optical resolution of the system was tested at the contractual points by both the customer and contractor reading 240X reduction bar targets. A list of the readings will be included in the NPIC's Test Engineer's Report. All of the readings exceeded those of the specification as well as the line pairs per mm per magnification. Sample readings are listed below.

Side	Objective	Light	Mag.	On Axis	1/3 Field	Hor. Edge	Vert. Edge
Right	40mm	Green	200	1,210	960T 1,078S	960T 1,078S	960T S
Left	80mm	White	100	538	538T S	480T 538S	538T 480S

SUBJECT: Part I Preacceptance Test for the High Precision Stereocomparator

Right	80mm	White	55	427	382T 427S	338T 382S	427T 382S
Left	40mm	White	20	170	151T 170S	135T 151S	151T 135S
Right	80mm	White	10	76	76^{T}_{S}	67^{T}_{S}	60^{T}_{S}

15. Part II of the Preacceptance Tests will take place 25X1 [redacted] during the week of 14 December 1970. This part will consist of procedures for exercising the HPSC with regard to operational imagery together with the associated computer programs. RED, PHD, and AID representatives will take part in this phase of the test.

[redacted] 25X1

Project Monitor
C/SDB/RED/TSG

Distribution:
Original - Route & File
1 - Contract File
1 - SDB/RED/TSG/NPIC
25X1 NPIC/TSG/RED/SDB/[redacted]